(b) whether Thorium would be used as fuel in this reactor; and

(c) if so, by when its work would be started and is likely to be completed?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI PRITHVIRAJ CHAVAN): (a) Yes, Sir.

(b) Yes, Sir. The fuel used in the reactor will be mainly Thorium based.

(c) The work on Advanced Heavy Water Reactor is scheduled to commence during the Eleventh Plan period. The details are being worked out and the schedule will be incorporated in the Project Report to be formally submitted for approval of the Government.

Joining N-experiment Club

2451. SHRI RAJKUMAR DHOOT: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that India has decided to join N-experiment Club spending huge amount of money;

(b) if so, the details thereof;

(c) the future plans for production of nuclear power during the next five years and the cost of production per unit of nuclear power; and

(d), the areas likely to be benefitted by this club?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI PRITHVIRAJ CHAVAN): (a) and (b) There are a number of international groupings/projects on nuclear related research. India joined International Thermonuclear Experimental Reactor (ITER) as a full partner in 2006 along with the European Atomic Energy Community (EURATOM), China, Japan, Republic of Korea, Russia and the United States of America. The salient feature of ITER project is to demonstrate the scientific and technological feasibility of fusion energy for peaceful purposes, an essential feature of which would be achieving sustained fusion power generation. The aim of ITER project is to show that fusion could be used to generate electrical power and to gain the necessary data to design and operate the first electricity producing plant. The resources of the ITER organisation shall be from contributions of member States in agreed proportions. The approximate financial implication on the part of India is estimated at Rs. 2500 crores over a period of 10 years which will be largely in the form of in-kind contribution.

(c) The present capacity in operation of 4120 MWe is planned to be increased to 7280 MWe in the next five years. Work on eight indigenous PHWRs with a total capacity of 5600 MWe and ten Light Water Reactors with a total capacity of 10,000 MWe based on imports has been proposed to be started in the Eleventh Plan. The current average tariff on nuclear power station is about Rs. 2.30.

(d) India's joining ITER is recognition of India's scientific and technological capability in fusion energy. Considering India's large energy needs in future, our gaining technological capability in fusion energy will be of considerable long term

benefit. Our participation in ITER will allow us to leap frog in terms of our national technological capability in fusion energy.

Thorium as fuel for atomic energy

2452. MISS MABEL REBELLO: Will the PRIME MINISTER be pleased to state:

(a) the places where Thorium is found in the country;

(b) the quantum of Thorium found in the country;

(c) the details thereof, State-wise; and

(d) how far technology is being developed to use Thorium for producing fuel for atomic energy?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI PRITHVIRAJ CHAVAN): (a) to (c) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of this Department has identified about 10.21 million tonnes of Thorium Mineral Monazite, as per details given below:—

State	*Resources (In million Tonnes)
Andhra Pradesh	3.73
Jharkhand and West Bengal	1.45
Kerala	1.37
Tamil Nadu	1.84
Orissa	1.82
TOTAL:	10.21*

* inclusive of indicated, inferred and speculative reserves

The monazite mineral is associated with beach sand heavy mineral placers as well as in the river sand placer and is associated with heavy minerals *viz.* Zircon, Ilmenite, Rutile, Monazite, Garnet etc. Monazite contains about 9% of ThO_2 .

(d) The third stage of the ongoing three stage Indian Nuclear Power Programme envisages development of Nuclear Reactors based on Uranium-233 (U-233) obtained by irradiating Thorium. The Government has taken a number of steps to develop appropriate technology for the utilization of Thorium. A few of the major steps are:

(1) Setting up the Research Reactor KAMINI at Kalpakkam, Tamil Nadu using U-233 Fuel obtained from irradiated Thorium. The Reactor has been operating since 1997. The fuel for Reactor is bred, reprocessed and fabricated indigenously.

(2) Irradiation of Thorium fuel bundle in Research Reactor at Trombay and in Pressurized Heavy Water Reactors (PHWRS).